


R2D2 / C3PO Video Conferencing Instructional Strategies and Learning Activities: Expert Validated Research Instructional Design Model

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INTRODUCTION

The rapid emergence of COVID-19 in the spring of 2020 forced a majority of academic institutions, teachers, administrators, and students to precipitously move to online learning. In that sudden move, cloud-based video conferencing technology, allowing teachers and students to interact live with one another, became the technology of choice for many. The key factor that precipitated the move to video conferencing technology in schools was the ability to humanize online learning and provide a live visual link between teacher and students. One technology that took hold quickly was Zoom.

A system such as Zoom, although not a breakthrough improvement in web-based video conferencing for current users and not as good as its leading competitor's products at the time, was able to disrupt the video conferencing market. According to Christensen and Horn (2011), this type of disruption can be caused by offering a product that original consumers could not use at a time when former "non-consumers" suddenly had a strong need for and demand for the product. With the onset of COVID-19, schools, and other academic institutions, which formerly were non-consumers of video-based conferencing, immediately needed to be able to connect teachers, students, and parents quickly and easily. Zoom was more affordable than the market leaders and easier to use. In fact, Zoom had accessible options that were free. In addition, as Christensen and Horn would have predicted, over time, Zoom became a stronger product, which manages tasks that are more complicated.

The problem is that most educators have little experience with online education, and specifically with video web-based conferencing. As a result, researchers were calling for tools and training on web-based video conferencing systems that would help educators and instructional designers increase student engagement, provide a culture of collaboration, and lead to student success. Armstrong (2014, 2016), and Armstrong and Gale (2018) created, enhanced, and validated a research-based instructional design model, R2D2/C3PO, to provide a framework for creating instructional strategies and learning activities teachers could use during a synchronous, web-based video conferencing session to foster student engagement and learning. The first four components of the R2D2/C3PO model are based on Bonk and Zhang's (2006, 2008) original work on the R2D2 model, read, reflect, display, and do. Bonk and Zhang used their model to focus on empowering teachers to deliver asynchronous online learning. At the time of their work, synchronous learning was in its infancy and starting to uptick. To address the lack of research and what

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is not known about how to develop effective instructional strategies and learning activities for synchronous video-based web-conferencing systems, Bonk and Zhang's model was enhanced multiple times by Armstrong (2014, 2016), and Armstrong and Gales (2018), to include five additional components and explanations of how to incorporate instructional strategies and learning activities into each component when using synchronous video web-based conferencing (Armstrong, 2014, 2016; Armstrong & Gales; 2018; Bonk & Zhang, 2006, 2008). Armstrong and Gale (2018) validated the new R2D2/3PO model using an experienced group of instructional designers, who participated in a validation study through interviews, a questionnaire, and a focus group using the Nominal Group Technique (NCT).

It is known from Davis's (1989) work, in his original Technology Adoption Model (TAM) that to ensure successful teaching and learning adoption online, users need to perceive the technology as both useful and easy to use. In Davis's study he emphasized that usefulness out ranked ease of use when determining user acceptance. Joo et al. (2018) emphasized that researchers have confirmed perceived usefulness and ease of use as significantly impacting intention to use technology. Al-Breiki and Al-Abri (2022) found that in a study of online learning during the COVID-19 pandemic, while both usefulness and ease of use impacted acceptance, so does online learning anxiety. The authors defined online learning anxiety as a person's uneasiness and uncertainty surrounding technology use, which can result in user frustration. The extended R2D2/C3PO model addresses these issues in the three C components of the updated model. Farooq et al. (2021) pointed out the importance of adding accessibility to the technology for teachers and students, along with training, and support mechanisms, which are critical success factors for adoption. It is not known what supports can help teachers and instructional designers to design and facilitate instructional strategies and learning activities that can reduce learner and teacher anxiety and improve student outcomes in online synchronous conferencing sessions. The R2D2/C3PO model addresses the support requirements needed for teacher, instructional designer, facilitator, and learner success.

This chapter describes each element of the R2D2/C3PO research-based, validated, instructional design model in-depth, providing generic examples of instructional strategies and learning activities for each component when using web-based video conferencing technology. The overarching objective of this chapter is to list and describe each model component, which are *Read, Reflect, Display, Do, Coaching, Conviviality, Critical Incident Questionnaire, Planning, and Organization*, and then to provide detailed descriptions of constructivist instructional strategies and learning activities that can be used. A second objective is to provide examples of use in practice, such as checklists, and easy-to-use template instructions. Another objective is to provide an example template for a Teacher/Facilitator Guide and Student/Participant Guide. Finally, specific examples for Zoom implementations are also available. Many of the features and functionality described for Zoom can readily be applied to alternative video web-based conferencing platforms.

BACKGROUND

Bonk and Zhang (2006) proposed a model for delivering distance education, and specifically, online learning. They argued that it was important to have such a model due to the diversity of the different generations and their level of competence with the Internet and online learning. The focus was on learning through reading online, exploring online, and listening to online podcasts. The model included four components: 1) read, 2) reflect/write, 3) display, and 4) do. To address the different learning styles across the generations, described as: 1) visual, 2) auditory, 3) reading/writing and, 4) kinesthetic/tactile. Bonk and Zhang explained that choices instructional designers and teachers make provide opportunities

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